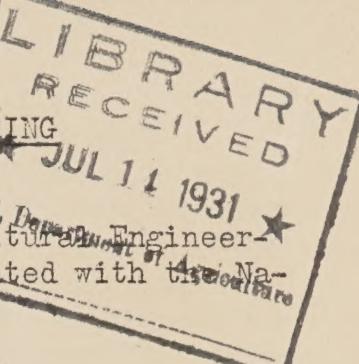


## **Historic, Archive Document**

Do not assume content reflects current scientific knowledge, policies, or practices.



1.9  
EN3 Ra  
SOMETHING ABOUT THE BUREAU OF AGRICULTURAL ENGINEERING



A radio talk by S. H. McCrory, Chief, Bureau of Agricultural Engineering, delivered through WRC and 42 other radio stations associated with the National Broadcasting Company, July 1, 1931.

--oo0oo--

I think I had better start by telling you what agricultural engineering is. The type of engineer who deals only with the farm no doubt is new to many of you. But, there is no mystery whatever about the agricultural engineer. He uses the same machinery and performs about the same operations that the farmer does, only he does it in a different way and for a different purpose.

While the farmer is using the machinery and tools that he has to the best of his ability, the agricultural engineer is trying to improve these implements and to develop better ones. While you, Mr. Farmer, are worrying about that wet spot in your corn field and grimly facing the fact that the soil is washing off your field, the agricultural engineer is trying to work out the best ways of draining that spot and holding the fertile top soil on your land. He is studying the problems of dairy-barn ventilation, of hog and poultry-house construction, of storages for grains and other produce. In fact, he is delving into all the equipment and operations of agriculture where, by the application of science and engineering, he believes he can improve them and enable the farmer to produce and market more cheaply. For is it not true that a dollar saved at the producing end is as surely earned as one made in the selling end?

But the agricultural engineer is doing more than saving dollars. He hopes to show the farmer how he may wisely spend some dollars - when they are available - in obtaining for his home the conveniences enjoyed by city dwellers. The engineer hopes to develop better house plans, and methods of remodeling and modernizing old houses to make them more livable - for instance, to include running water, and sanitary sewage disposal. Agricultural engineers, along with others, are working to bring electricity, at reasonable cost, to the farm house and to find out how it may be used profitably in farming operations.

All this is a big job, you say? Well, it is a big job, but isn't it well worth while? Your State agricultural experiment station thinks so and is now engaged on these problems, and the agricultural extension service of your State is bringing you the results. Recently your representatives in Congress have thought enough of agricultural engineering to create a separate bureau for it in the Department of Agriculture.

I have told you in a general way what agricultural engineering is and what it is trying to do; now let me get down a little closer to my subject -- the bureau itself. First, let me tell you something of its organization. We are not a large bureau, as Government organizations go -- only about 140 workers all told. About half of us are trained engineers. The other half is made up of various classes of trained workers such as draftsmen and skilled mechanics, together with the editorial, accounting, and clerical force that must always be part of such an organization.

Now, as you know, these are days of specialization. You couldn't expect a man especially qualified to tackle the problems of Western irrigation to be well prepared to deal with machines for distributing fertilizers for cotton in the Southeast, or for harvesting grain in the wheat belt. So our engineers have training in the special lines where they are to work. Some are specialists in irrigation, some in drainage; others deal with the mechanical problems of power and farm machinery; still others are especially qualified for farm buildings work. So you see we are prepared to deal with the engineering problems of all of the ordinary phases of agriculture.

We divide the subject of agricultural engineering into these groups -- first, irrigation; second, drainage (including control of soil erosion); third, farm power and machinery; and fourth, farm buildings. The order in which I have given them may not represent their relative importance. Irrigation is of vital importance in the arid West; drainage and erosion control require especial attention in various localities scattered throughout the country. Considering the country as a whole, perhaps farm power and machinery is the subject that will be given our major attention in the near future. But we must not neglect the buildings, including that all important one -- the home for the farmer and his family. Then there is the barn, the poultry house, and the hog house -- to mention only three -- which are vitally involved in the farm income.

So, without trying to place these groups of activity in their proper order, I shall endeavor to give you an idea of what the Bureau of Agricultural Engineering is attempting to do with each of them.

Take power and machinery. It is the job of the agricultural engineer to find out exactly what a machine should do. That sounds easy, but it is not. Let me illustrate. We are trying to improve the fertilizer distributor. The first thing to find out is exactly how the fertilizer should be dropped -- just how much and where it should be placed in relation to the seed. There is no way to learn this except by experimenting on a large number of plots, each handled in a different way according to a definite program set up in advance. I can not here discuss this in detail, but it involves the help of agronomists to observe and to judge the effect of the various placements on plant growth and yield. Having found out how the fertilizer should be placed it is then necessary to devise a machine that will do it. This is also a matter of experimentation. When we can make a rough, experimental machine that will do what we want, we shall leave perfecting it to the manufacturers.

I could cite any number of other opportunities for the agricultural engineer in the field of mechanics, but I must pass to the subject of buildings. There are nearly twelve billions of dollars invested in the farm buildings in the United States. I think you will agree with me that any subject involving that sum is well worthy of serious study. President Hoover's Conference on Home Building and Home Ownership appreciates the importance of the problem of improving the farm home. Our Bureau is assisting in this movement.

As a matter of fact, comparatively little has been done to determine what are the best materials and practices for use in the building of various farm structures. For instance, what are the best materials for barn roofs, for hog-house floors? How can the fire hazard in farm buildings be reduced? What are the best types of storage buildings for grains, for vegetables, for fruits? There are any number of problems relating to farm structures -- from

the farm home itself down to fences - that need the attention of the engineer.

Now for irrigation and drainage. Everyone knows that in the far West the rainfall during the growing season is not enough to meet the requirements of crops. It is necessary to collect and store the water resulting from melting winter snows in the mountains. The water must then be used as economically as possible because the farmer has to pay for what he uses. Right here we have one of the most important jobs of the Bureau of Agricultural Engineering -- to find out what is the least water that crops can get along with and how to apply it. I can not tell you in these few minutes about the many other irrigation problems that the Bureau is trying to solve; but here is the important thing: The final purpose of all of the work is to save water and to get the most out of what there is.

Many of you don't need irrigation in years of normal rainfall, and you probably have made no provision for it. Your difficulty, in the long run, is likely to be too much water rather than too little. So, in the Eastern half of the United States, the Bureau is studying such problems as disposal of surplus water by pumping; the proper size of ditches; and the best way to drain sugar-cane land. These are only a few of the many drainage problems the Bureau hopes to solve.

Finally, there is soil erosion. In many parts of our country the top soils are rapidly washing away. The matter is so serious that Congress supplied money to the Department of Agriculture to study the problem and endeavor to work out means of preventing this great waste. The Bureau of Agricultural Engineering, along with other agencies, is now working on this problem. And here, where I mention "other agencies", is a good place to say that nearly all of our work has phases that require the help of specialists other than engineers. Our work is therefore largely cooperative with other bureaus of the Department of Agriculture and with the State experiment stations.

I have given you, I hope, some idea of what we mean by agricultural engineering, and of how the new Bureau of Agricultural Engineering hopes to aid the farmers. Agricultural engineering studios are not new in the Department; they have been going on for many years. Bulletins are available on the various subjects of which I have spoken and you may obtain them by writing to the Office of Information, Department of Agriculture, here in Washington.

